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A

NEW METHOD

OF

RHINOSCOPIC EXPLORATION;

BY

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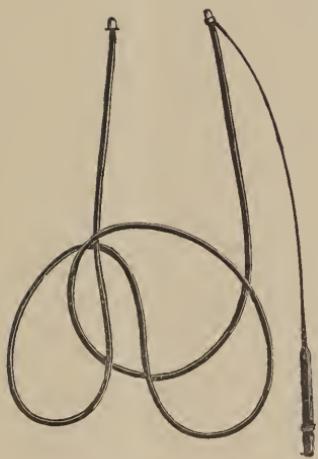
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Fig. 1.



PALATAL RETRACTOR,
(Ready for Application.)

A NEW METHOD OF CONTROLLING THE VELUM PALATI
AND
ENLARGING THE PHARYNGO-BUCAL APERTURE IN
RHINOSCOPIC EXPLORATION.

By PHILIP S. WALES, M. D.,

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The difficulties in the way of thoroughly illuminating and examining the naso-pharyngeal cavities are well known to all practical workers with the rhinoscopic mirror. The variations in the area of the space bounded in front by the velum palati, and behind by the posterior wall of the pharynx, are wide in the normal condition. In certain subjects it is so ample, that at the first "sitting" most of the parts situated above the level of the palatal process, without the aid of any mechanical contrivances, may be easily inspected with a large mirror. In by far the greater number of persons, however, this area is more restricted, even narrowed to a very small fissure; in either case the smallest mirror only being available, some mechanical contrivance is required to enlarge it. This condition offers two difficulties, that must be overcome to arrive at success; it cuts off the necessary degree of light indispensable for thoroughly viewing the parts, and precludes the use of mirrors of sufficient size to make an accurate examination of the relative condition and position of the parts. The irritability of the palate and fauces also varies in different persons, occasionally being so trifling that the velum will remain relaxed and hang down in front of the pharyngeal wall, as it does normally in respiration through the nostrils, and in consequence good observations may be made. In some of these cases even the touching of the velum with the mirror does not excite it to contraction, which, however it

ought never to be permitted to do. Most generally the irritability is such that upon the mere opening of the mouth, or a glance of the eye of the patient at the operator's hand holding the mirror as it approaches his face, will instantly cause irresistible contraction of the palatal veil upwards and backwards, against or nearly in contact with the pharynx.

The half arches vary in amplitude and shape. The space bounded by them and the base of the tongue presents occasionally almost a quadrilateral outline and the arches are widely separated, but usually the space is irregularly triangular, the apex of the triangle corresponding with the uvula, while its base is narrow. These conditions correspond with similar ones of the bases of the dental arches. The age of the patient also affects the amplitude of the fauces, being proportionally smaller, the younger the patient is inside of adult age.

The base of the tongue is subject to various peculiarities of size, shape, and degree of elevation. In a few, mostly adult individuals, it is broad and flat, and when the mouth is widely opened lies well down below the plane, corresponding to the border of the molar alveoli. This position of the tongue is taken immediately the jaws are separated, or may be assumed by the voluntary efforts of the patient. In a still larger proportion of adults and in most children this part of the tongue is narrower, thick from above downwards, and when the mouth is open rises above the plane of the crowns of the molars and often completely hides the entirety of the velum from view, by touching the posterior portion of the palatal process.

Many persons, especially those of nervous temperament, have such imperfect volitional control over the movements of the tongue, that even when all the physical conditions of conformation are favorable, and but little irritability exists, the rhinoscopic examination is very difficult. The tongue persistently rises to the roof of the mouth and offers considerable resistance to the spatula, the use of which not unfrequently produces under these circumstances repeated retching.

The first attempts to inspect the naso-pharyngeal region were made by Czermak during the winter of 1857-8, and the method then adopted he called rhinoscopy. It was first tried upon

himself with the aid of his auto-laryngoscopic apparatus, and by frequent practice he saw very distinctly a portion of the nasal fossæ, the septum, the turbinate bones, the posterior surface of the velum, and the orifices of the Eustachian tubes. In examining other persons, he made them depress their tongues themselves by means of a depressor; the velum then became readily accessible, and when necessary, he elevated and drew it forward with a hook, so as to facilitate the introduction of the mirror. Manipulation in this manner required both hands, — one in holding the hook, and the other the mirror. In order not to occupy the two hands simultaneously, he had made at the commencement of his rhinoscopic studies, a small instrument, which might serve at the same time the purposes of a hook and a mirror, and which would necessitate the employment of one hand only. He describes it as constructed out of a metallic tube, bent at a right angle, and therefore composed of two arms, of which one is long, while the other—the vertical—is short; an oval steel mirror is attached at an angle of forty-five degrees, at the bent part, between the two arms. The light enters through the long arm; the short arm is obliquely cut at its extremity, to be introduced behind the velum into the pharyngo-nasal cavity. He was soon convinced of the necessity, he tells us, of substituting for the major part of the long arm a half tube, in order to have more light, and a closer inspection of the small oval mirror. It seemed to him equally advantageous to replace the short arm by a vertical plate of metal, which could be secured and removed by means of a ring; the introduction of the instrument was thus facilitated. He goes on to state that this simple, and it may be said primitive instrument, he frequently employed with success upon himself firstly, and afterwards upon patients. The position and inclination of the apparatus are the determining cause, by means of which some parts of the pharyngo-nasal cavity and of the nasal fossæ, rather than others, are found illuminated and reflected by the mirror.

In July, 1859, he made some rhinoscopic experiments upon a dead body, for the purpose of more readily exposing those regions, till then inaccessible to view, and for the better appre-

ciation of the bearing of his new method of exploration. These experiments again convinced him, that in this way we can expose to view the posterior wall of the velum, the walls of the pharyngo-nasal cavity up to the sphenoid bone, the orifices of the Eustachian tubes, and the extent of the posterior orifices of the nasal cavity, as well as the turbinated bones. He did not perceive the floor of the nasal cavity, nor of the inferior meatus; but he suggested that it might be done by using double mirrors, of which the superior might reflect its object into the inferior. The utility of this suggestion has not been made apparent. In comparing the relative difficulties of rhinoscopic and laryngoscopic inspection, he declares that those of the former are much graver than those of the latter, unless favored, for example, by insensibility, by fissure or partial deficiency of the velum. Czermak's rhinoscopic instrument described above, does not seem to have been a success, and was laid aside; for in March, 1860, he examined a case in which there was some pharyngeal disease and other means were used. The anatomical conditions, he states, were favorable, and an inspection was first made without any instrument to control palatal movements, but in order to examine the affected parts with greater liberty, and on a more extensive scale, he requested the patient himself to depress the base of his tongue with a rectangular spatula; and then, he says, with his left hand he elevated the velum palati in front and above, by means of a flat hook with a long stem, resembling in form a spatula; of which the flat part contained an opening. In his article two spatulas are figured, one with and one without a fenestrum. The application of this hook, he remarks, did not cause the slightest inconvenience in the present instance; and after regulating the inclination and position of the mirror, which had been introduced into the pharynx with his right hand, he was enabled to complete, by degrees, a satisfactory and clear examination of the part affected, which permitted him to make a drawing that figures in his paper, showing the extent and character of the disease. With the aid of the spatula he did not see the whole of the posterior nares; for he distinctly states that on the right side, which was normal, "we can perceive

through the posterior orifice of the nasal fossa of the same side a portion of the upper part of the turbinate bones, and a portion of the meatus of the right side, while the inferior parts are hidden by the *velum palati*."

That Czermak was fully impressed with the difficulties encountered in this and many other cases in thoroughly and completely exploring the nares and pharynx, in consequence of the movements of the *velum*, and that he entertained strong hopes that instruments would be devised, or aid of some kind finally afforded by zealous laborers in this field, is manifest in a concluding paragraph of his paper, where he states that "it is only in the future, when the impulse which I have given to the subject shall have been followed for some time, that we can attempt to judge to what point the local depression of sensibility by means of cold water, of anesthetics, narcotics, or the patients getting used to it, on the one hand, and the gradual increase in the powers of dexterity of the physician on the other, may facilitate the use of the rhinoscopic method, if not favored by circumstances."

This is the point at which, in 1860, Czermak left the subject. He had not devised an efficient means to overcome the muscular action of the *velum palati*, and therefore had not seen, except in glimpses, the entire walls of the naso-pharyngeal cavities as far as the anatomy of the parts permit.

Moura four years later wrote, that "all authors have recognized the necessity of enlarging the inferior orifice of the pharyngo-nasal cavity, although we may sometimes make a rhinoscopic examination without interference from this part." That this necessity was still deeply felt, is shown by the multiplicity of suggestions and the array of mechanical devices for controlling the palatal movements, described by various writers on this subject. To render the palate flaccid, it was proposed to submit it to repeated touching and rubbing to diminish its sensibility, to spray it with bromide of potassium (Auzias—Turrene), to weary the patient out and to distract his attention. Voltolini hoped by forcibly depressing the base of the tongue, Semeleder by directing the patient to breathe through the nose, and Czermak to cause him to emit nasal sounds, to relax the pal-

atal muscles, so as to give sufficient space for the use of the mirror. All these various plans may occasionally succeed, but for the art of rhinoscopy to make any considerable progress, more successful agencies are required. That they were practically of little account, may be easily conceived when it is known that the most expert operators were constantly suggesting new mechanical contrivances.

Turck constructed an instrument like a polypus forceps, for drawing forward the palate, another similar to the urethral forceps for clamping the uvula, and a third consisting of a small tube with wire sling to catch the uvula. Moura suggested his *tenseur du voile du palais*, which was simply two hooks sliding one upon the other, mounted upon a handle, and designed to seize the palate. All these various contrivances are useless; for experience has shown that we cannot conveniently pull forward the elevated palate. The same amount of irritation and energetic contractions as that excited by seizing the palate in order to pull it forward, is not noticed when palate hooks are employed. This sort of instrument was adopted by Czermak. Turck also suggested a hook with a horizontal groove to prevent the velum slipping off. These instruments are much too heavy and irritating, and cannot, as a general rule, be borne by the patient, and the soft structures have not unfrequently been damaged by their use. To overcome these objections, I constructed some years ago a hook of flexible wire, which is light, easily managed, can do no harm, and is capable of doing all that such an instrument can accomplish.

A third method may be attributed, I believe, to Turck, who used an instrument consisting of curved points which are introduced behind the velum and then opened; one blade rests on the posterior wall of the pharynx, while the other presses the velum forwards.

Stork combined the hook and mirror, both having rings on their extremities, their handles, at the middle point of the stems, being united like a pair of scissors, so that by pressing together the separated rings, the hook lying upon the mirror is raised; the mirror together with its stem has a longitudinal sliding movement; while upon the anterior portion of it

a small leaf may be placed as a substitute for the tongue spatula. The mirror and the hook are pressed against each other by a spring. The instrument thus closed is introduced behind the velum, and then, by an approximation of the rings, opened, and the hook, upon which the velum now rests, is drawn towards the observer. Voltolini's rhinoscope is a long, black spatula, on the end of which, at a prescribed angle, a steel mirror with a short neck is placed.

The above account of the instrumental and other means to control the movements of the palate is a fair summing up of what has been done in this direction, and as may have been gathered from its perusal, these contrivances are all more or less imperfect, difficult of management, and not of general application. In my opinion, the method which I shall now describe overcomes all the difficulties as far as the anatomical structure of the parts will permit, leaves nothing to be desired, and fully realizes Czermak's sanguine anticipations.

My principle consists essentially in overcoming the contraction of the palatal muscles by elastic force, and the means of fully carrying it out will be found in an india-rubber cord. The simplest method of putting it in position, after having selected one of such a diameter—two millimetres will do—as will readily pass through the inferior meatus into the pharynx without any instrumental assistance, is the following: the ends are introduced into the nostrils, until they both reach the lower portion of the pharynx. At this instant the patient is directed to cough, if the presence of the thread has not already excited this movement; the force of expiration will pretty surely project them into the mouth, when they may be apprehended with the fingers and drawn externally until the middle portion of the cord, which is external, is arrested against the nasal septum. Gentle traction is continued until the soft palate is well drawn forward, when the threads are passed up over the ears, and downwards beneath the chin and there tied, or they may be held by the patient himself. At any moment after the ends of the elastic are secured at the point indicated, the tension of the cord and correlative palatal pressure may be increased by seizing the threads as they pass out of the mouth

and gently drawing them forward, until the palatal contraction is entirely overcome, and the area of the pharyngo-buccal space ample enough to receive the largest mirror. It will sometimes be observed that where there is much irritability, the velum palati momentarily contracts, especially at the time when the mirror is introduced, but soon yields to the elastic force of the thread. Should any impediment whatever exist in the nostrils, that the cord cannot be passed some special means will be required as a cord carrier. Of course, an expert hand may make use of any instrument that may chance around—a catheter, slips of whalebone, or wood. I have found that the contrivance passing under the name of Belloc's sound, put in pocket-cases, is not in a majority of instances appropriate to effect this object: it is too large, and too much curved to pass through the nostrils without being propelled by an improper degree of force that causes both pain and bleeding. An example of these objections to that instrument as ordinarily furnished may be related. At a demonstration in my office, when six medical gentlemen were present, Belloc's sound was tried upon the nostrils of all present; it could not be passed except in a single case, and then but upon one side. The experiment, indeed, might have succeeded in all, but the instrument was not pressed when any considerable amount of pain was produced.

The device which I employed at first was a thin lamina of soft metal, six inches long and less than an eighth wide, mounted at each extremity with a small ring of an amplitude a little greater than the elastic cord, which having been passed through them, is tipped with small, smooth, oblong fragments of lead. When the instrument is to be used, the cord is drawn through the rings until one of its tips comes against the corresponding end; slight tension of the elastic will retain the two in contact while the point thus formed is being conducted along the inferior meatus. When the metallic point reaches the posterior wall of the pharynx, the elastic projecting externally is pulled through the exterior ring, and made quite slack so that the instrument may be withdrawn from the nares, leaving the cord in position; a similar proceeding is then practiced upon the

other nostril. The metallic points of the cord, now in the pharynx, may be easily thrown forward by coughing, seized with the fingers and drawn externally. The metallic lamina, on account of its flexibility, will thus be bent as a bow over the bridge of the nose, and out of the way. This is a neat, facile, and quick method of placing the elastic cord in the nostrils. I have also used in cases where there was obstruction to the passage of the cord, a catheter similar to the one designed for the Eustachian tube, except that both ends are alike; the catheter is introduced into one of the nostrils, and when its point is eligibly lodged posteriorly, the cord may be thrust through it until it reaches the throat and is expelled by the mouth by expiratory efforts, when the catheter may be withdrawn and the same manœuvre executed upon the other side. The cord tipped with metal may also be carried into the pharynx by means of a long and slender probe of whalebone, as shown in Fig. 1, the point of which is received into a depression on the tip.

In the course of my experiments as to the best method of controlling the palatal contraction, I have used several other devices for conducting the elastic into position, but the last plan described recommends itself by its simplicity and easy application. The cord should pass along the inferior meatus, which experience shows is oftenest free from those morbid changes which block up the area of the nostrils, and most tolerant of foreign bodies. The mucous membrane of the nose and throat is far less irritated by the contact of elastic substance than of metallic objects, and it is surprising how little indeed in many cases is the irritation caused when the soft palate is doubled upon itself and stretched forward by the cord. I have repeatedly kept it in this position for thirty and fifty minutes. The area gained varies, of course, with the normal size and configuration of the patient's fauces. I have expanded the area in one case—by no means favorable, for the throat was exceedingly irritable and narrow, and there was chronic pharyngitis—by gentle traction on the cord until the antero-posterior diameter measured one inch and a quarter, and the transverse one inch. With a seven-eighths mirror, the larger portion of his posterior nares could be seen at one view.

The discovery of means of amplification of the pharyngo-buccal aperture has occupied my attention for several years. I have had only moderate success until the discovery of the device I now bring to the notice of the profession.

Its chief merits are the simplicity of the apparatus, and the facility with which any professional person may employ it in exploring the posterior nares and the pharyngeal cavity. The cord itself may well take the place of Belloc's sound in any case wherein it may be necessary to conduct a thread through the nostrils, as in plugging the nares for epistaxis. Here, however, I employ a little bulb of rubber at the end of a hollow rubber cord, and after the bulb is placed in position through the fauces, it may be inflated by blowing air through its open extremity which projects exteriorly from the nose.

In rare cases foreign bodies lodge in the pharynx; either shifting from the nares to which they have gained entrance or having been introduced through the fauces. I have twice removed camel's hair brushes from the cavity, broken from their stems by the muscular contraction of the half arches, while they were being used in applying solutions of nitrate of silver to the mucous membrane. In these instances as soon as the elastic cord was put in position and the soft palate well drawn forwards, the brushes dropped of their own accord into the mouth.



